made in all cases of arthritic joint pain of questionable etiology.

4. A roentgenogram may be of some value in differential diagnosis.

DISCUSSION

PHILIP KING BROWN, M. D. (909 Hyde Street, San Francisco)—The conditions under which uric acid is increased in the blood do not always indicate gout or a gouty diathesis, nor do we know what regulates the excretion of uric acid. We can influence it with cinchophen, but the mechanism by which nature varies it is one of the unsolved problems. Nor is it always increased in the height of acute attacks.

I have been interested in gout in relation to trauma and to infection. A patient with typical left big-toe gout hobbling across the street had his right toes run over by a Ford. No fracture occurred, but that night the toes of the right foot were all involved in a typical gout attack. A prominent surgeon with asthma, chronic bronchitis, and nephritis got a fresh cold and a bronchopneumonia. While in bed on light diet he developed a typical podagra attack.

Heavy wines and heredity have been held as responsible for most cases, but thirty-three years of hospital service has convinced me that alcohol plays an insignificant rôle, for gout is a very rare disease.

It is interesting to find the statement in Barker and Cole's handbook for the laity on rheumatism that "the cause of gout is definitely recognized and it is known to have nothing directly to do with infection of any kind or in any part of the body."

While gout may be purely a condition which arises from faulty metabolism, the fact remains that, like rheumatism, it attacks joints most likely to be subject to trauma and infection and, like rheumatism, it appears when the physical defenses of the individual are low, particularly from chronic infections.

In spite of the rarity of the typical disorder with the semicircular punched-out areas of bone showing in x-rays outside the actual articular surfaces, Doctor Harbinson is right that chronic and even acute joint disorders particularly involving the toes, ankles, knees, and fingers, need a trial of colchicum before a diagnosis is possible if the use of salicylates is a failure.

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ERNEST H. FALCONER, M. D. (384 Post Street, San Francisco)—Doctor Harbinson calls attention in his paper to the fact—mentioned by Thomas Futcher and other American writers—that gout is more prevalent in this country than generally supposed. Futcher writes: "If physicians will recognize the fact that there is probably no such affection as chronic rheumatism, and that the vast majority of cases of chronic arthritis are either gout, arthritis deformans, or some form of infectious arthritis, it will be found that, with due regard to the points in the differential diagnosis, a great many more cases will be justly attributed to gout than has been the case in the past."

In connection with the etiology of gout, it is interesting historically to note that a writer by the name of Falconer, in 1772, called attention to the association of lead poisoning and gout. Also the great clinician Sydenham wrote: "Great eaters are liable to gout, and of these the costive more especially. Eating as they used to eat, when in full exercise, their digestion is naturally impaired. Even in these cases simple gluttony and free use of food, although common incentives, by no means so frequently pave the way for gout as reckless and inordinate drinking."

A careful history may be of much help in cases suspected of gout, especially an inquiry into habits, hereditary predisposition, and the question of lead exposure. Garrod found that 33 per cent of the gout patients that came under his care in hospital practice had at some time in their lives suffered from lead poisoning.

Blood chemistry and roentgenograms are of help in the diagnosis, but as Doctor Harbinson indicates they are not procedures essentially diagnostic of gout. The purpose of this paper, I take it, is to awaken our interest and keep before us the possibility of gout as a cause of the arthritic joint pains in some of this large group of patients who are constantly seeking medical advice.

POLIOMYELITIS CONTROL*

By GEORGE E. EBRIGHT, M. D.
San Francisco

THE problem of the control of poliomyelitis is difficult because important factors concerned in its dissemination are not yet clearly known, especially those referable to the recognition of human carriers of the disease.

HISTORY

It is in order first to review the history of the disease as it has come to be known and then to consider methods for its prevention.

J. K. Mitchell described an Egyptian mummy, which was supposed to show changes due to poliomyelitis.

In 1784 Michael Underwood of London described a "debility of the lower extremities," which is apparently the first description of the disease in medical literature. In speaking of its tendency to attack children previously reduced by fever, he may have observed but did not recognize the first hump of the dromedary type of the malady.

In 1835 John Badham of England reported "Four Remarkable Cases of Suddenly Induced Paralysis of the Extremities, Occurring in Children, Without Any Apparent Cerebral or Cerebrospinal Lesion."

In 1840 appeared the classical monograph of Jacob Heine. Twenty years later he published a second edition of his work under the name of "Infantile Spinal Paralysis." This twenty-year lapse of time marked the period of investigation of the clinical history of the disease.

From 1863 up to 1887 was the period of study of its pathological anatomy. Medin's article in 1887 placed the disease in the class of those which occur in epidemics and introduced the most recent era of the understanding of the disease.

RECENT INVESTIGATIONS

In 1905 came Ivan Wickman's monograph as a result of the Norwegian epidemic of that year and a description of abortive or non-paralytic cases.

In 1909 the disease was first produced in monkeys by Landsteiner and Popper, then by Flexner and Lewis and by Strauss. And it was transmitted from one monkey to another by three different observers working independently in New York, Vienna, and Paris. Also in 1909 Flexner and Lewis and Landsteiner and Levaditi discovered the fact that the disease was due to a filtrable virus, and the two former workers demonstrated that an attack of experimental poliomyelitis protected the individual against a second attack. Then immunizing substances were found in the

* Editor's Note—This paper by the president of the California State Board of Health is of timely interest because of the prevalence of poliomyelitis.

blood serum of monkeys that had had the disease, and immunizing substances were demonstrated in the blood of human patients convalescent from the disease. The serum of a patient who had been paralyzed thirty years before was able to protect a monkey from poliomyelitis. Three strains of the virus have been described by Flexner and Amoss. One of inherent low potency which does not excite any reaction in monkeys. Another which produces severe paralytic effects in monkeys and, thirdly, a strain of intermediate severity obtained, however, from an unusually severe clinical case. They know of no means by which a strain active for monkeys can be attenuated artificially. It retains a high virulence. A strain of low virulence may, however, be stepped up in monkeys. The same workers observed a certain strain for a long time and found that it varied up and down in potency, and in fifteen years passed through three distinct phases of virulence.

In persons dead of poliomyelitis the virus has been found in the central nervous system, the intestines, trachea, nose, and mouth. In living patients with the disease the virus is present in the nose and mouth, pharynx, and intestines. The secretion from the mouth and intestines of persons who have had the disease has had the power of infecting monkeys several months later—in one case nearly seven months—usually at least for thirty days, but it begins to lose its virulence rather quickly after the acute stage—after about eight to fourteen days.

The virus has been demonstrated repeatedly in persons who were perfectly well but who had been in contact with those with the disease. Anderson and Frost recovered immune bodies in the blood of 66 per cent of persons who had been in close contact with cases of the disease and who had not contracted it. Swedish observers believe that most adults have had the disease and are therefore immune.

SYMPTOMS

It has been estimated that there are from five to seven abortive cases for every paralytic one. Probably this is a low estimate, and it undoubtedly varies with epidemics. Abortive cases predominated in the early part of the Minnesota epidemic of 1921. An excerpt from the Minnesota State Board of Health Biennial Reports for 1920-21 reads as follows: "Attention of the State Board of Health was called to an outbreak . . . which at first was thought to be cerebrospinal meningitis. In general the onset was abrupt with temperature of 103-5, rapid pulse, headache, vertigo, pain in legs, and frequently stiff neck, ranging from slight stiffness to retraction. In some cases the head was retracted, the thighs, legs, forearms, and fingers flexed. Vomiting and constipation were present in the majority of cases. Epistaxis was frequent and often the first pronounced symptom. Sore throat was frequent and both drowsiness and restlessness were common. Of the early cases Kernig's sign was said to be present in all, and Brudzinski's sign in all severe cases; knee reflexes were increased, decreased, or normal.

The early cases presenting meningeal symptoms without paralysis as a rule did not appear to be so seriously sick as the usual epidemic meningitis cases, and most cases recovered rapidly after but four or five days' illness. Multiple cases in the same family occurred and in many instances several persons in a family had, one after the other, a transient illness of but a day or two in which the onset was abrupt, with or without sore throat, and with general symptoms as above described, but without meningeal symptoms other than a stiff neck, while but one or two serious cases with marked meningeal symptoms occurred.

Later early cases which were thought to have no muscular impairment were carefully studied, and approximately 50 per cent of these cases showed lowered or absent reflexes in one or more members, loss of muscle tone, and in a few instances actual muscular atrophy."

It has been shown that the nasal secretions contain a specific protective substance active upon the virus. It appears to be constant in adults and is also present in children, though more irregularly than in adults. Nasal washings of healthy adults in general neutralize the virus. This same substance has also been found in the blood.

SPREAD OF THE DISEASE

Transmission of the Disease—It is the consensus of opinion that poliomyelitis is transmitted chiefly by means of direct contact with persons who harbor the virus in the nose or mouth—either contact with persons suffering from the disease, or who have had the disease, or who are carriers *who may never have had the disease.*

Rats and stable flies have been suspected of being possible intermediate hosts, but there appears now to be no doubt that the chief factor is contact with a patient or a human carrier.

Infection may take place through the mouth, nose, by means of the conjunctiva and tear duct, and the stomach—the latter infrequently.

Diagnosis—Epidemic meningitis, botulism, epidemic encephalitis, veronal poisoning and cerebrospinal syphilis may present a striking resemblance to poliomyelitis. In the presence of an epidemic of poliomyelitis a diagnosis of botulism in a suspected case would seem unsafe unless confirmed by laboratory findings. In recent epidemics extensive recourse has been made to examination of the spinal fluid as a means of differentiation from meningitis and lethargic encephalitis. Regan places especial stress upon the colloidal gold reaction which he finds constantly in the syphilitic zone. The cell count is always high and sugar is increased, according to New York reports.

PREVENTIVE MEASURES

Prevention — Bedside Precautions — Patients should be insolated in the acute stages of the disease in much the same way that typhoid patients are. They should be protected against visitors and against insects as possible accidental carriers. The

body discharges should be disinfected. Separate dishes and silver should be provided which are to be scalded after use. Attendants should be careful of their hands after contact with patient. Carbolic acid is useless.

Nose and throat sprays of antiseptic solutions are useless, and will not prevent infection. They do harm in removing a natural protective substance in the nasal secretion which neutralizes the virus of the disease.

General Public Measures of Prevention—Infantile paralysis is one of the few infectious diseases in which the mode of transmission is still unknown. Consequently we are not able to take effective measures against its spread. There is no evidence that regulations against the congregation of persons have had any influence in controlling infantile paralysis. This would be expected when the relative infrequency of secondary cases in families is considered.—Department of Public Health of Massachusetts.

There has appeared thus far no advantage in closing schools unless possibly in the spring or early summer in the presence of a rising epidemic.

The report of the Committee on Poliomyelitis of the Washington Conference of State and Provincial Boards of Health contained the following recommendations:

First: That an isolation period for a patient of not less than two weeks nor more than three weeks from onset be required unless the temperature has not returned to normal in the meantime.

Second: That children of the same household in contact with a patient be restricted from places of public assembly for a period of fourteen days from last date of contact, as determined by the health officer.

Third: That an adult of the household, if the patient is properly isolated, may continue his vocation, provided it does not bring him into contact with children at any time.

Disinfection—Your committee recommends that: first, the discharge from the nose, throat and bowels of the patient be disinfected promptly; second, the caretaker shall wash her hands with soap and hot water promptly after handling said discharges; third, the caretaker shall wash her hands similarly before leaving the room occupied by the patient; fourth, isolation shall be terminated by a thorough washing of entire body and hair of the patient, and the room cleaned with soap and hot water, aired and sunned; fifth, sick-room precautions should include the usual attention to cleaning and disinfection of eating utensils, personal and bed clothing, rugs, door-knobs, and other things handled by the patient or caretaker.

Precautions for Physicians and Nurses—The committee recommends that unless a special covering and gloves be worn (a) the physician and nurse shall so handle the patient that discharges shall not soil their clothing and special care be taken to prevent droplet infection; (b) the physician and nurse shall thoroughly wash their hands before leaving the premises.

Hospitalization—The committee approves the removal to hospitals of patients affected with poliomyelitis when proper isolation and satisfactory care for the patient cannot be secured in the home; but the committee believes that during the early stage of the disease the patient needs rest in bed, and transfer to a hospital may be detrimental to his welfare.

Other Suggested Measures Designed to Control the Disease—(a) The committee does not recommend the use of travel certificates, but travel and contact with children should be discouraged.

(b) Surveillance for persons coming from infected districts, in the opinion of your committee is not necessary, unless the person has been definitely exposed to infection.

(c) The most effective agency in the control of this disease is the employment of public health nurses, who, in cooperation with the physician, will teach sick-room precautions, the necessity for rest in bed, and the need of proper support for affected parts.

(d) Expert diagnosticians should be provided and the use of lumbar puncture urged.

(e) Food, especially such as is consumed uncooked, should be considered as a possible means of transferring the infectious agent and appropriate measures should be instituted to protect the public during an outbreak.

(f) Where poliomyelitis occurs in a school, your committee advises that the school be not closed, but that daily medical supervision be instituted.

(g) Efficient screening and the use of approved insecticides should be employed so that insects shall not have access to the patient or his excretions.

(h) Household pets should be excluded from the sick room.

(i) In the presence of poliomyelitis a search for, and a careful examination of, all ill children should be made. All children having fever should be insolated pending the diagnosis.

(j) Prompt reporting of all recognized or suspected cases, personally or by telegraph, or by telephone, is essential, in addition to the written report required by law.

Future research, it is to be hoped, will reveal a practical test for the detection of clinical types and carriers, a test for immunity and a means of conferring artificial immunity against poliomyelitis.

384 Post Street.

Quackery Advertisements—It is reported that the two leading newspapers in Minneapolis do not accept advertisements of quacks. This is practically true also of the New York *Times*. It is regrettable that the large daily papers in Massachusetts cannot feel that advertisements setting forth unsound claims are not worthy of a place in their columns.

We confidently believe that there will be a time when the advertisements of quacks will be prevented by legal enactment.—*Boston M. and S. J.*